

WHAT IS CLAIMED IS:

1. A virtual machine instruction processor for executing commands using a remote virtual machine comprising:
 - a local memory cache for storing executable data for commands;
 - 5 a local processor for executing virtual machine instructions, wherein the local processor is configured to search the local memory cache for executable data when a command is received and transmit a command request to a remote virtual machine if the executable data for the command are not found in the local memory cache; and
 - 10 a controller for controlling the interface of data between the local processor, the local memory cache and the remote virtual machine.
2. The virtual machine instruction processor of Claim 1, further including a read only memory (ROM) connected to processor for storing an address of a remote virtual machine.
- 15 3. The virtual machine instruction processor of Claim 2, wherein the ROM comprises a TCIP/IP stack.
4. A host device containing a virtual machine instruction processor for executing instructions received from a remote virtual machine comprising:
 - 20 a host processor;
 - a communication controller connected to a network for communicating with a remote virtual machine;
 - a virtual machine instruction processor connected to the host processor and the communication device, the virtual machine instruction processor comprising:
- 25 a local memory cache for storing executable data for commands;
- a local processor for executing virtual machine instructions, wherein the local processor is configured to search the local memory cache for executable data when a command is received and transmit a command request to a remote virtual machine if the executable data for the command are not found in the local memory cache; and
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a controller for controlling the interface of data between the local processor, the local memory cache and the remote virtual machine..

5. The host device of Claim 4 further comprising a plurality of host processors wherein the virtual machine instruction processor is connected to each of the plurality of host processors.

6. The host device of Claim 4 further comprising a plurality of virtual machine instruction processors and a plurality of host processors, wherein each of the plurality of host processor is connected to a different one of the plurality of virtual machine instruction processors.

10 7. The host device of Claim 4, wherein the local processor is the host processor and the host processor treats the virtual machine instruction processor as a co-processor.

8. A system for communicating instructions over a network from a remote virtual machine to a host processor with a virtual machine instruction processor, the system comprising:

15 a network;

a remote device comprising:

a communication controller connected to the network;

a virtual machine.

a host device not co-located with the remote device comprising:

20 a host processor;

a communication controller connected to the network for communicating with the remote device; and

25 a virtual machine instruction processor connected to the host processor comprising a local memory cache for storing executable data for commands, a local processor for executing virtual machine instructions, wherein the local processor is configured to search the local memory cache for executable data when a command is received and transmit a command request to a remote virtual machine if the executable data for the command are not found in the local memory cache, and a controller for controlling the interface of data between the local processor, the local memory cache and the remote virtual machine.

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9. The system of Claim 8 wherein the network is the Internet.
10. The system of Claim 8 wherein the virtual machine is a Java virtual machine.
11. The system of Claim 10 wherein the virtual machine instruction processor transmits command requests to the remote virtual machine.
- 5 12. The system of Claim 8, wherein the virtual machine determines the identity of the virtual machine instruction processor from the request.
13. The system of Claim 8, wherein the virtual machine is configured to analyze a history of requests from the virtual machine instruction processor.
- 10 14. A server for communicating instructions over a network from a virtual machine to a host processor with a virtual machine instruction processor, the server comprising:
- a communication controller connected to a network;
- a virtual machine configured to receive virtual language commands from a remote virtual machine instruction processor, and
- 15 identify byte-codes to the remote virtual machine through the communication controller.
- 15 15. The server of Claim 14, wherein the virtual machine determines the identity of the virtual machine instruction processor from the request.
- 20 16. The server of Claim 14, wherein the virtual machine is configured to analyze a history of requests from the virtual machine instruction processor.
17. The server of Claim 14, wherein the virtual machine is a Java virtual machine.
- 25 18. A method of communicating commands over a network from a remote virtual machine to a host processor using a virtual machine instruction processor, the method comprising:
- receiving a command from the host processor;
- determining whether data required to execute the command is stored in a local memory accessible to the virtual machine instruction processor;

- transmitting the command from the virtual machine instruction processor to the remote virtual machine if data to execute the command is not stored in the local memory;
- executing the remote virtual machine to obtain executable data required to execute the command request;
- returning executable data to the virtual machine instruction processor from the remote virtual machine; and
- executing the executable data by the virtual machine instruction processor.
- 10 19. The method of Claim 18, wherein returning executable data further includes storing the executable data in the local memory.
20. The method of Claim 18, wherein the executable data comprises operations, byte-codes, classes and/or translations for the command.
- 15 21. The method of Claim 18, wherein the virtual machine is a Java virtual machine.
22. The method of Claim 18, wherein transmitting the command to the remote virtual machine includes transmitting the command over the Internet.
23. The method of Claim 18, wherein executing the remote virtual machine further includes identifying the identity of the virtual machine instruction processor that transmitted the request.
- 20 24. The method of Claim 18, further including analyzing a history of requests transmitted from the virtual machine instruction processor.
25. A virtual machine instruction processor embedded in a host device comprising a host processor for executing instructions received from a remote virtual machine comprising:
- means for receiving a request by the virtual machine instruction processor from the host processor to execute a command;
- means for determining whether the executable data required by the command is stored in a local memory accessible to the virtual machine instruction processor;

- means for transmitting the command from the virtual machine instruction processor to the remote virtual machine if the executable data for the command is not stored in the local memory;
- means for operating a remote virtual machine to obtain executable data;
- means for returning the executable data to the virtual machine instruction processor from the remote virtual machine; and
- means for executing the commands by the virtual machine instruction processor using the executable data.
- 10 26. The virtual machine instruction processor of Claim 25, wherein the virtual machine is a Java virtual machine.
27. The virtual machine instruction processor of Claim 25, wherein the command request is transmitted over a network.
- 15 28. A method of communicating instructions over the Internet between a remote Java virtual machine and a host processor using a virtual machine instruction processor, the method comprising:
- 20 receiving a command from the host processor;
- determining whether the executable data for the command is stored in a local memory cache of the virtual machine instruction processor;
- transmitting a command request from the virtual machine instruction processor to the remote Java virtual machine over the Internet if the executable data for the command is not stored in the local memory cache;
- 25 identifying the identity of the remote virtual machine instruction processor transmitting the command request;
- identifying executable data for the command request at the remote virtual machine;
- transmitting the executable data to the virtual machine instruction processor from the remote virtual machine, wherein the executable data

returned is based at least in part on the type of processor that transmitted the command request; and

executing the executable data by the virtual machine instruction processor.

- 5 29. The method of Claim 28, wherein the executable data comprises operations, byte-codes, classes and/or translations for the command.